In re Patent Application of:
CAIN
Serial No. **10/043,457**
Filing Date: **JANUARY 10, 2002**

In the Specification:

Please replace paragraph [0009] on page 3 with the following rewritten paragraph:

A1

In view of the foregoing background, it is therefore an object of the present invention to schedule time slots in a manner that is responsive to variations in communication link demands for wireless mobile communication systems.

Please replace paragraph [0022] on page 6 with the following rewritten paragraph:

A2

FIG. 2 is a more detailed block diagram illustrating a ~~pair of~~ wireless mobile node from the mobile communication systems ~~in accordance with the present invention~~ illustrated in FIG. 1.

Please replace paragraph [0038] on page 10 with the following rewritten paragraph:

A3

Distributed scheduling allows any ~~two~~ pair of wireless mobile nodes, such as **12a** and **12b**, for example, to schedule a semi-permanent time slot without having to communicate with any other wireless mobile node. In other words, there is no centralized master/slave type of coordination with all of the wireless mobile nodes **12a-12h** for scheduling the semi-permanent time slots. Since the time slots among the wireless mobile nodes **12a-12h** are scheduled in a distributed fashion, there is no single point of failure in the wireless mobile communication network **10**.

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Please replace paragraph [0059] on page 17 with the following rewritten paragraph:

A4

A lower bound on the value of N_{frame} for any graph can be determined by noting that each node requires at least as many time slots as the node has neighbors, ~~i.e,~~ i.e., the node requires a number of time slots at least equal to its degree. Then N_{frame} must be at least as great as the maximum node degree over the entire graph. Thus, denoting the degree of node i by d_i the lower bound on N_{frame} is

$$N_{frame} \geq \max_i \{d_i\} \qquad (2)$$

For the example network **10** illustrated in ~~FIG. 2~~ FIG. 1 the reuse portion is assigned the scheduling with N_{frame} equal to the minimum number of time slots that must be used according to equation (2). Note that several nodes, namely all nodes but node 1, are assigned less than the full set of time slot. Thus, an enhanced scheduling algorithm may be able to assign additional slots to some of the links without introducing conflicts in scheduling.

Please replace paragraph [0175] on page 65 with the following rewritten paragraph:

A5

This example implicitly assumed that a single frequency band is used for each of the beams. In this case, a node could have several beams simultaneously communicating

over the same band without interference. This interference-free operation may be difficult to support in practice. A similar formulation of the problem could be done with each beam operating in a different frequency band, i.e., beams a, b, and c in Figure 10 each use a different frequency band. In terms of the scheduling algorithm, we would apply the same constraints on the allocation of SP time slots. However, in actually allocating the time slot/beam ~~conbinations~~ combinations we would need to find an allocation such that the two nodes are using the same beam (equivalent to using the same band) as well as the same time slot. This equivalent to making each beam/time slot combination different from the scheduling perspective. Thus, the number of available time slots is the number of beams multiplied by the frame size. In this case the constraint on assigning SP time slots to potential neighbors is given by

A5 cncld

$$B \cdot N_{frame} \geq 2 \cdot N - 1, \qquad (9)$$

where B denotes the number of beams. This constraint on the number of neighbors is slightly more restrictive than that of (7) and (8) because of the requirement that nodes which share an SP time slot must also use the same beam/frequency channel as well as the same time slot. For the example $N_{frame} = 5$ and $B = 3$, then the constraint of (9) allows 8 neighbors for each node whereas the constraints of (7) and (8) will allow 9 neighbors for each node.